

slow motion produced by clockwork. The probe, by touching the mercury, completes a circuit, through which a current is instantly transmitted from a local battery. The line-wire is included in this circuit, and a corresponding movement is produced in the diamond point of the receiving instrument. A local electro-magnet is also made by this current, and the arrangements are such that the current is thus diverted from the mercury at the instant after the probe has touched it, and there is consequently no spark when the probe leaves the mercury. The instantaneous current which thus passes is always from the probe to the mercury; in other words the mercury is the negative and the probe the positive terminal. If any moisture be present its oxygen goes to the probe (which is of platinum) and the hydrogen to the mercury, which thus, instead of oxidising, is kept always bright. Evidently the higher the mercury stands in the tube, the sooner will the contact be made, and thus the scale of equal parts before-mentioned gives the height of the mercury.

The diamond point makes a succession of short marks which (in virtue of a mechanical interruption) form a regular series up to the moment when the probe touches the mercury, after which they cease for several seconds. The cylinder revolves once in ten minutes, and the diamond point has at the same time a slow longitudinal motion (being mounted on a screw axle), so that the successive indications of the same thermometer form a nearly continuous curve (traced by points).

Thus by one line wire and one diamond point the curves for all the six instruments are drawn at a station which may be 200 or 300 miles distant. The value of such an instrument for furnishing the director of a central station with accurate data on which to base his weather-predictions speaks for itself; and as regards expense, all the expenses of photography and of reducing and engraving photographic traces are saved. It has been worked in Belgium over a wire of the length of 750 miles.

(To be continued.)

NOTES

THE Royal Institution Session will commence with a course of six lectures on astronomy, adapted to a juvenile audience, by Prof. R. S. Ball, F.R.S., Astronomer-Royal in Ireland. Dr. W. Huggins will give a discourse on Comets at the first Friday evening meeting, January 20, 1882.

THE International Commission for the next transit of Venus, established in Paris under the presidency of M. Dumas, has accomplished its work and published a series of instructions, which will appear in the next number of the *Comptes rendus* of the Academy of Sciences, and be sent to all astronomers and observatories. A complete scheme for international co-operation has been adopted.

As No. 12 of the Bibliographical Contributions, edited by Mr. Justin Winsor of the Harvard University Library, we have a List of the Publications of Harvard University and its Officers, 1870-80. It contains, for example, the publications of the Astronomical Observatory, the Bussey Institution, the Museum of Comparative Zoology, &c., followed by an alphabetical list of the officers (professors, &c.) of the University with their publications, and including such names as those of Agassiz, father and son, J. A. Allen, the ornithologist, J. P. Cooke, professor of chemistry, Asa Gray, H. A. Hagen, professor of entomology, E. C. Pickering, professor of astronomy, the late Benjamin Peirce, S. H. Scudder, N. S. Shaler, J. Trowbridge, professor of physics, and others.

THE experiments made at the Paris Opera in electric lighting have been successful for regulators. Not less than thirty-six

Brush lamps illuminated the celebrated monumental staircase, with Werdermann in the circular gallery, and Jasper in the buffet. Sixty-four Jablockhoff lights were disposed on the ceiling round the chandelier with success in spite of the numerous changes of colour. The incandescent light exhibitors—Swan, Maxim, and Edison—were not ready to act their part, and the opportunity was lost for them; a second will be given to-day.

A RUMOUR has been spread by the *Journal Officiel* that the Electrical Exhibition will be closed on the 1st of November. The impending resignation of M. Cochéry is stated to be at the bottom of this semi-official attempt. But it is certain no alteration will be made in the original date of closing, except to extend the time granted up to December 1.

THE death is announced, at the age of eighty-four years, of M. Dubrunfaut, a well-known French industrial chemist.

IT is stated that M. Herve-Mangon, director of the Paris Conservatoire des Arts et Métiers, has decided to resign his post in order to devote himself more entirely to politics, he having been elected recently as *député* for the department of La Manche. Probably he will be succeeded by Col. Laussedat of the Polytechnic School.

PROF. HAECKEL has arrived at Vienna on his way to Ceylon.

IN connection with the Museum and Library, Queen's Road, Bristol, the following syllabus of a course of nine lectures, on literary and scientific subjects, to be delivered during the winter, 1881-82, has been issued:—October 31, 1881, Clements R. Markham, C.B., F.R.S., Sec. R.G.S., the Basque Provinces of Spain; November 14, Prof. W. J. Solas, M.A., F.R.S.E., F.G.S., the Natural History of Volcanoes; November 28, Prof. S. P. Thompson, B.A., D.Sc., F.R.A.S., Electric Storage and Lighting; December 12, Prof. William Ramsay, Ph.D., F.C.S., Improvements in Iron and Steel Manufacture; January 23, 1882, Prof. Bentley, F.L.S., Epiphytic and Parasitic Plants, with some observations on the Life of other Plants; February 6, Ven. Archdeacon Norris, B.D., Canon of Bristol, Redcliffe Church: its Architecture and History; February 20, J. E. H. Gordon, B.A., the Leyden Jar; March 6, W. Saville Kent, Infusoria; March 20, Rev. A. H. Sayce, M.A., the Land of the Phœnicians.

LIEUT. FRIEDRICH WILL will shortly undertake a thorough zoological-entomological investigation of the provinces of Bahia, Pernambuco, and Piahy; he is sent by the Entomological Society of Stettin, the president of which is Dr. C. A. Dohrn.

WE have received parts 1 and 2 of the first volume of the *Transactions* of the Seismological Society of Japan, containing an address on Seismic Science by Prof. Milne, together with papers by Messrs. Ewing, Wagner, and Gray, on various seismometric and seismographic instruments, and by Mr. Mendenhall on a determination of the Acceleration of Gravity at Tokio. The Society is to be congratulated on the numerous proofs of activity which it has already shown, and on the very valuable scientific work it is doing in this rather neglected branch of study.

A USEFUL paper by Mr. W. J. Harrison, Science Demonstrator for the Birmingham School Board, on the Teaching of Science in Public Elementary Schools, has been issued by him in a separate form. He resumes all the reasons for science-teaching in schools in a clear and forcible manner, and gives some hints that might be of service to science teachers. In Birmingham, we believe, they are now endeavouring to obtain money for science scholarships, by which boys of merit will pass from the Board Schools to the great Foundation School there (King Edward's Grammar School), then to the Mason College,

and perhaps subsequently to some university. There are now 2000 children and 200 pupil teachers under science instruction in Birmingham, and the results so far have been most encouraging.

MAJOR-GENERAL MAITLAND, writing to the *Times* in connection with the Bordeaux Phylloxera Congress, makes a suggestion which appears quite worthy of attention. He believes that all the remedies hitherto applied or proposed are open to the reproach to which all empiric treatment of disease is obnoxious—viz. the attacking of a symptom instead of the essential root of the disease, and thus betraying a want of right apprehension of its true origin. "This, in my humble view," General Maitland says, "is to be attributed to exhaustion of the vitality of the plant, induced by unduly and unnaturally overtasking its productive powers. In this respect the phylloxera of the French vineyards bears a close analogy to the red spider of the Indian tea garden, to the leaf-worm of the Indian, American, and other cotton fields, and, in short, to parasitic growth wherever proving fatally destructive throughout the vegetable kingdom. The mode in which this law of nature, as it may be termed, operates, may be understood by reference to the physiological paradox, 'Life dies; death lives.' Wherever the vitality of a plant is abnormally diminished by over-plucking, over pruning, and unceasing inexorable demands to produce more, more, when nature demands rest and repose to recruit exhaustion, the sap, the plant's life-blood, becomes poor, sluggish, and enfeebled. Parasitic life is then evolved, and preys upon the little remaining life that injudicious culture has left the plant. If the above view in regard to the origin of phylloxera be accepted as an approximation to the truth, the remedy would seem to be self-indicated—repose. Give the vineyards rest."

AN extraordinary report of four large expeditions for Africa being organised in Brussels, was lately given in the *Pall Mall Gazette*, and has this week been reproduced by the *Daily News*. There is, however, absolutely no foundation for the statement.

THE *Colonies and India* states that the unusual spectacle of snow was seen on Table Mountain on August 16. Such an occurrence has been recorded only once since 1813, viz. in 1878.

THE first list of the honorary council of the International Electric Exhibition which is to be held at the Crystal Palace, comprises the following names of well-known men of science:—Mr. James Abernethy, President Institute Civil Engineers; Prof. W. G. Adams, F.R.S., Sir James Anderson, Prof. Ayrton, F.R.S., Sir Henry Cole, K.C.B., Mr. William Crookes, F.R.S., Capt. Douglas Galton, C.B., F.R.S., Dr. Gladstone, F.R.S., Col. Gouraud, Sir John Hawkshaw, C.E., F.R.S., Dr. J. Hopkinson, F.R.S., Prof. Fleeming Jenkin, F.R.S., Sir E. J. Reed, C.B., M.P., Mr. B. Samuelson, M.P., Dr. C. W. Siemens, F.R.S., Mr. W. Spottiswoode, President Royal Society. The following gentlemen will be the chief officers for the Exhibition: Manager, Major S. Flood Page; secretary, Mr. W. Gardiner; superintendent, Mr. P. L. Simmonds; assistant engineer for Exhibition, Mr. R. Applegarth, C.E.; clerk of works, Mr. W. Carr.

THE Programme of the Technological Examinations of the City and Guilds Institute for 1881-2 contains several new subjects and arrangements—improvements on previous programmes. The examination papers set for 1881 are interesting.

WE notice in the Russian journal, *Old and New Russia*, an interesting paper on M. Tyaghin's wintering at Novaya Zemlya, on hunting in that land, together with a good sketch of the bird life in the neighbourhood of the wintering place.

DR. GOBI, who has investigated during many years the flora of the White Sea, has published his researches in a separate work in Russian.

WE notice in a paper published in the *Annals* of the Spanish Society of Natural History (vol. x. 1881), that Don Fr. Quiroga

observes that the numerous implements in Spanish museums which are usually described as nephrite are mostly made of fibrolite, this name having been given by Count de Bournon to a variety of sillimanite. Out of 115 hatchets which were considered as nephrite, and were found mostly during the geological survey of the provinces of Guadalajara and Cuenca, only one was of nephrite, whilst 111 were of fibrolite and three of jadite. The fibrolite is often found among the mica-slates of the provinces of Madrid and Guadalajara.

THE same volume of the *Annals* contains a paper, by Don S. Calderon of Arana, on the evolution of the earth.

A STRIKING instance of the activity of man in destroying forests may be shown by the following figures, which we find in M. Olshevsky's paper in the last issue of the *Izvestia* of the Russian Geographical Society. After having taken into consideration the surveys which were made in the province of Ufa before 1841, and the recent distribution of forests in that province, M. Olshevsky shows that the area of forests, which formerly was about 17,577,000 acres, has now diminished by at least 3,500,000 acres; although the population is still very sparse, that is, less than three souls per square mile, and it was yet less some time ago.

THE well-known publishing firm of A. Hartleben (Vienna, Pesth, and Leipzig) have recently published a little work by Heinrich von Littrow, "Carl Weyprecht, der österreichische Nordpolfahrer." It contains many characteristic reminiscences as well as letters of the late discoverer of Franz-Josef Land. It is a fitting and touching literary monument to a brave, energetic, highly-cultivated, kind, and modest man of science, whose useful career was unfortunately cut short so prematurely.

Auf der Höhe is the title of a new international review, edited by Leopold v. Sacher-Masoch, and published at Leipzig by Gressner and Schramm (London: Dulau). The first number (October) contains several interesting articles, though none of them scientific; among the list of contributors, however, we notice the names of several Continental men of science.

DR. KING's report on the Government Cinchona Plantation in British Sikkim for the year ending March last, shows a continued and highly satisfactory progress—a progress that has been made not only in the extended cultivation of well-known and established species, but also in the propagation of valuable and rarer kinds. Most satisfactory results are recorded of the species known as *Cinchona Ledgeriana*, one of the varieties of *Calisaya* which, as Dr. King says, is surpassingly rich in quinine, and which has derived its name from Mr. Ledger, a collector who brought the seed from South America. Regarding another valuable kind, namely, the plant yielding the Carthagena or Columbian bark, which is largely imported to this country from the northern part of South America, and of which four plants were sent to the Government Plantations from Kew in January, 1880, Dr. King says, "They arrived in good condition and during the year they were increased largely by cuttings. Propagation went on most favourably for some time, but later on in the year the young plants were severely attacked by the pest only too well known to gardeners as 'thrips.' The usual treatment was applied with vigour, but in spite of this, when the year ended the six original plants had been increased only to sixty rooted plants and ninety partially rooted cuttings." Dr. King, however, further says that "every effort will continue to be made to increase the stock of this interesting species." Both the general condition of the plantation and the financial results are reported as satisfactory, and the results as gathered from the quinologist's report, which is appended, are also satisfactory, inasmuch as they show an increased manufacture of febrifuge and also an increased demand. Dr. King and his co-workers

are to be congratulated on the continued successful results of their labours.

DR. OBST, the director of the Ethnographical Museum at Leipzig, after attending the Archæological Congress at Tiflis, intended to make an exploring tour in the Caucasus, Armenia, and Asia Minor, and then to return to Saxony *viâ* Constantinople and Athens.

A STRANGE phenomenon was recently observed at Emerson, near Lake Winnipeg. A dark cloud formed of myriads of winged black ants passed over the place from east to west. When it descended the ground over a large area was covered an inch deep with the insects.

MAUNA LOA (Hawaii) is again active, and the lava threatens the port of Hilo, situated on the east side of the island.

IN a letter which we have received from Mr. G. H. Kinahan he disavows the suggestion imputed to him (NATURE, vol. xxiv. p. 471) that Laurentian rocks occur in Co. Tyrone.

THE additions to the Zoological Society's Gardens during the past week include a Macaque Monkey (*Macacus cynomolgus* ♀), a Bonnet Monkey (*Macacus radiatus* ♀) from India, presented by Mr. G. E. Jarvis; a Vervet Monkey (*Cercopithecus lalandii* ♂) from South Africa, presented by Mrs. Brassey; two Leopards (*Felis pardus*) from Ceylon, presented by Lieut.-Col. J. S. Armitage, F.Z.S.; a Mesopotamian Fallow Deer (*Cervus mesopotamicus* ♀), two Beatrix Antelopes (*Oryx beatrix* ♀ ♀), two Arabian Gazelles (*Gazella arabica* ♂ ♀) from Muscat, presented by the Lord Lilford, F.Z.S.; a Naked-footed Owlet (*Athene noctua*), European, presented by Mr. R. J. Marlton; a Common Kestrel (*Tinnunculus alaudarius*), a Common Hare (*Lepus europæus*), European, presented by Mr. W. K. Stanley; a Paradise Whydah Bird (*Vidua paradisæa*) from West Africa, presented by Mr. Bowyer Bower; two Bonnet Monkeys (*Macacus radiatus*) from India, a Bell's Cinixys (*Cinixys belliana*) from East Africa, deposited; an Osprey (*Pandion haliaetus*), European, purchased; a Hardwicke's Hemigale (*Hemigalea hardwickii*) from Borneo, received on approval.

OUR ASTRONOMICAL COLUMN

THE SATELLITE OF NEPTUNE.—We subjoin such a table as was suggested by Prof. Newcomb for indicating with little trouble the approximate position of the satellite of Neptune, at any time about the approaching opposition. The argument u has the same significance as in Newcomb's Tables:—

| Argument u . | Angle of Position. | Distance. |
|-----------------|-----------------------|-----------|
| 0 ... 180 ... | 73°3' ... 253°3' ... | 11'4" |
| 10 ... 190 ... | 65°7' ... 245°7' ... | 13'1" |
| 20 ... 200 ... | 59°7' ... 239°7' ... | 14'6" |
| 30 ... 210 ... | 54°8' ... 234°8' ... | 15'8" |
| 40 ... 220 ... | 50°4' ... 230°4' ... | 16'6" |
| 50 ... 230 ... | 46°3' ... 226°3' ... | 16'9" |
| 60 ... 240 ... | 42°3' ... 222°3' ... | 16'9" |
| 70 ... 250 ... | 38°2' ... 218°2' ... | 16'4" |
| 80 ... 260 ... | 33°8' ... 213°8' ... | 15'5" |
| 90 ... 270 ... | 28°6' ... 208°6' ... | 14'3" |
| 100 ... 280 ... | 22°2' ... 202°2' ... | 12'7" |
| 110 ... 290 ... | 14°0' ... 194°0' ... | 11'0" |
| 120 ... 300 ... | 2°7' ... 182°7' ... | 9'2" |
| 130 ... 310 ... | 346°4' ... 166°4' ... | 7'7" |
| 140 ... 320 ... | 324°2' ... 144°2' ... | 6'8" |
| 150 ... 330 ... | 299°4' ... 119°4' ... | 7'0" |
| 160 ... 340 ... | 278°6' ... 98°6' ... | 8'0" |
| 170 ... 350 ... | 263°7' ... 83°7' ... | 9'6" |
| 180 ... 360 ... | 253°3' ... 73°3' ... | 11'4" |

Values of u at Greenwich noon

| | | |
|---------------------|---------------------|---------------------|
| Oct. 28 ... 187°55' | Nov. 27 ... 225°26' | Dec. 27 ... 262°95' |
| Nov. 7 ... 80°12' | Dec. 7 ... 117°83' | Jan. 6 ... 155°51' |
| 17 ... 332°69' | 17 ... 10°39' | |

| Motion of u in | |
|------------------|---------------|
| Days. | Hours. |
| 1 ... 61°26' | 1 ... 2°55' |
| 2 ... 122°51' | 2 ... 5°11' |
| 3 ... 183°77' | 3 ... 7°66' |
| 4 ... 245°03' | 4 ... 10°21' |
| 5 ... 306°28' | 5 ... 12°76' |
| | 6 ... 15°31' |
| | 12 ... 30°63' |

From which figures u may be interpolated for any hour required. When u is found in the second column of the table, the angle of position is to be taken from the second column.

COMET 1881 f (DENNING, OCTOBER 3).—The comet discovered by Mr. W. F. Denning of Bristol during the night of the 3rd inst. has been observed at Marseilles by M. Coggia, and at Lord Crawford's Observatory at Dunecht. Elements calculated by Dr. Copeland and Mr. Lohse upon Dunecht observations on October 9, 10, and 12, are as follows:—

Perihelion passage 1881, September 12°0943, Greenwich M.T.

| | | | |
|--------------------------|--------|-----------|--------------------|
| Longitude of perihelion | | 22° 6' 9" | } M. Eq. 1881°0 |
| Ascending node | | 72 47 45 | |
| Inclination | | 7 45 12 | |
| Log. perihelion distance | | 9·859822 | |
| Motion—direct. | | | |

Hence it is found that this comet, like that discovered by Mr. Barnard on September 19, is receding both from the sun and the earth. As remarked in Lord Crawford's Circular, No. 33, the elements bear some resemblance to those of the fourth comet of 1819, detected by Blanpain at Marseilles, which was certainly moving in an elliptical orbit of very limited dimensions. This circumstance alone attaches a particular interest to Mr. Denning's comet, and makes it of importance that it should be accurately observed for position as long as practicable.

CERASKI'S VARIABLE.—U CEPHEI.—The following Greenwich times of minima depend upon Mr. Knott's observation on the 2nd inst. with the period 2^d.49280:—

| | h. m. | | h. m. | | h. m. |
|-------------|-------|-------------|-------|------------|-------|
| Oct. 22 ... | 10 24 | Nov. 11 ... | 9 1 | Dec. 1 ... | 7 39 |
| 27 ... | 10 4 | 16 ... | 8 41 | 6 ... | 7 18 |
| Nov. 1 ... | 9 43 | 21 ... | 8 20 | 11 ... | 6 57 |
| 6 ... | 9 22 | 26 ... | 7 59 | 16 ... | 6 37 |

BIOLOGICAL NOTES

THE HYPOPHYSIS IN ASCIDIANS.—In a second paper to the Belgian Academy on this subject (*Bull.* No. 6) M. Jolin describes the quite special arrangement of the "hypophysary gland" in *Phallusia mamillata*. Besides the principal excretory duct existing in all Ascidiæ, and here considerably reduced, there are a large number of orifices by which the glandular tubes pour their product of secretion into the peribranchial cavity, of which the cloaca forms the median part, which receives all the products and residues of the organism, to be cast out. Hence the products of the hypophysis in this species are probably also excrementitious, and the gland is physiologically the kidney of the animal. If it be so with *P. mamillata* it is likely to be the same with the other Tunicata; and though, in most, the hypophysis opens into the mouth, one cannot infer that the product is to be utilised in the alimentary canal. From the morphological point of view it is noteworthy that in glands properly so-called, arising from an epidermic or epithelial invagination, the product of secretion is generally eliminated by a single orifice, and that the only exceptions occur in the category of urinary apparatus (Cestodes, Trematodes, &c.).

THE CORALS OF SINGAPORE.—We learn from a paper (*Proc.* of Berne Nat. History Society) by Prof. Studer, on the Corals of Singapore, that there are no less than 122 species known from this locality. Of these fifty-one species are special to the locality, whilst the others inhabit the seas of New Guinea, of the New Britannic Archipelago, of the Solomon Islands, and reach as far as Fiji, some few extending as far as Tahiti. At the same time the Singapore corals yield very few species in common with the Red Sea, the Seychelles, and Mauritius, and these are Fungidae, but no Madreporaceæ. Thus it may be established that the coral fauna of the Indian Ocean must be divided into two distinct regions—a western and an eastern, the latter extending far to the east into the Pacific. These two